

10

PROCESSING AND PROPERTIES INDEX

Aroxy compounds. Formation of chlorosulfonic esters of hydroxycarboxylic compounds by the action of chlorosulfonic acid on aroxy compounds. V. O. Lukashovich and T. N. Sokolova. *Compt. rend. acad. sci. U.R.S.S.* 64, 693-6 (1946) (in French).—Aroxybenzene in a little CCl₄, mixed with a tenfold excess of ClSO₃H below -8°, stirred 1 hr. at -5°, and thrown onto ice, yields, after recrystn. from abs. AcOH, 70% *p*-hydroxyazobenzene chlorosulfonate (I), orange-yellow crystals, m. 116.5-17.5°. Similarly, 3,3'-dimethylazoxybenzene yields 50% 3,3'-dimethyl-4-hydroxyazobenzene chlorosulfonate (II), orange-yellow prisms, m. 46-7.6° (from ligroin); 3,3'-dichloroazoxybenzene yields 80% 3,3'-dichloro-4-hydroxyazobenzene chlorosulfonate (III), orange-yellow crystals, m. 55.4-8.2° (from anhyd. AcOH); and the α- and β-isomers of 4-bromoazoxybenzene yield 80% 4-bromo-4'-hydroxyazobenzene chlorosulfonate (IV), m. 106-7°. I, II, III, and IV are saponified by boiling 4-5 hrs. with 2-3% aq. or alc. KOH to the corresponding hydroxycarboxylic compds.; that from II m. 114-15° (from ligroin); that from III m. 124.6-6.8° (from aq. MeOH); and that from IV m. 157-8°. ClSO₃H reacts slowly with *p*-hydroxyazobenzene (from sapon. of I) to yield 4-(4-hydroxyphenylazo)benzenesulfonyl chloride, m. 131-2°.

Robert W. Shortridge

[illegible]

CA

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The mechanism of the formation of azo compounds by the reduction of nitro compounds with alkaline stannite solutions. V. O. Lukashevich. *Doklady Akad. Nauk S.S.S.R.* 57, 907-10(1947); *Chem. Zentr.* (Russian Zone Ed.) 1948, II, 955; cf. *C.A.* 42, 67Kk. --When 1.5 mols. stannite was used, nitro compds. reacted smoothly to yield azoxy compds. Thus $p\text{-O}_2\text{NC}_6\text{H}_4\text{CO}_2\text{H}$ (I) yielded $p\text{-azoxybenzoic acid}$ (II), m. 114.5°. $m\text{-Azoxybenzoic acid}$ was formed analogously and identified as its *di-Et ester*, m. 76-8°. The azo compds. simultaneously formed amounted to about 4%. Repetition of the expts. of Goldschmidt and Eckardt (*Z. physik. Chem., Abt. A*, 56, 385(1900)), in which large amts. of azo compds. were formed, demonstrated that G. and E. had overlooked the simultaneous formation of hydrazo compds. In L.'s expts. with I, 60.4% azo, 16.1% azoxy, and 23.5% hydrazo compds. were obtained. When 2 mols. stannite was used to 1 mol. of nitro compd. and the reaction was interrupted by the addn. of acid, the yield was the same as with 1.5 mols. of stannite. When 1.5 mols. of stannite was used first and then another 0.5 mol. added after 30 min., the same mixt. of products was obtained as with 2 mols. added at first. II with 0.5 mol. stannite gave a mixt. of products similar to that obtained from the nitro compd. with 2 mols. of the reducing agent. The assumption that azoxy compds. cannot be converted directly into azo-compds. by reduction is not tenable. M. G. Moore

LUKASHEVICH, V. O.

PA 64/49T5

USSR/Chemistry - Catalytic Reactions Nov/Dec 48
Chemistry - Reduction

"Reduction of Aromatic Nitro Compounds," V. O.
Lukashevich, Moscow, 17 $\frac{1}{2}$ pp

"Uspekhi Khim" Vol XVII, No 6

Discusses reduction of nitro compounds by Fe
and Zn filings, action of sodium on nitro,
nitroso, and azo compounds and reduction of
nitro compounds with sodium amalgam, reduction
of nitro compounds and related materials in the
presence of acids, and mechanisms of these
reactions.

64/40m

LUKASHEVICH, T. N.

V. 6.

PA 67/49T21

USSR/Chemistry - Azoxy Compounds
Azo Compounds

Nov 48

"Regrouping the Azoxy Compounds," V. O. Lukashevich,
T. N. Kurdyumova, Sci Res Inst of Org Intermediate
Products and Dyestuffs imeni K. Ye. Voroshilov,
13 $\frac{1}{2}$ pp.

"Zhur. Obshch Khim" Vol XVIII, No 11

Reaction of chlorosulfonic acid with azoxy com-
pounds gave azochlorosulfates of the azo compound,
which upon heating in dilute alkali solution, trans-
formed quantitatively into the p-hydroxyazo com-
pounds. Submitted 18 Jun 48.

67/49T21

PA 55/49T10

LUKASHEVICH, V. O.

USSR/Chemistry - Amino-Phenyl

Dec 48

"Formation of 2,2'-Diaminodiphenyl During the Regrouping of Hydrazobenzene," V. O. Lukashevich, L. G. Krolik, State Sci Res Inst of Org Intermediate Products and Dyes imeni K. Ye. Voroshilov, 2 pp

"Dok Ak Nauk SSSR" Vol LXIII, No 5

Observed action of dry hydrogen chloride on hydrazobenzene solution in ~~ether~~, benzene and similar solvents in the hope of obtaining 2,2'-diaminodiphenyl. A toluene solution was worked out to produce results desired. Submitted by Acad S. I. Vol'fkovich 16 Oct 48.

55/49T10

APPROVED FOR RELEASE 04/03/2001

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ASB 49

LUKASHEVICH, V. O.

PA 149T34

USSR/Chemistry - Thiols
Aromatic Compounds

Aug 49

"Research in the Field of Aromatic Sulfur Compounds," V. O. Lukashevich, M. M. Sergeyeva, Sci Res Inst of Org Intermediate Products and Dyestuffs Imeni K. Ye. Voroshilov, 17 1/2 pp

"Zhur Obschch Khim" Vol XIX, No 8

Studied several reactions and complex conversions of sulfur compounds of benzene series. Showed that reducing cleavage of aromatic disulfides by alkaline sulfides proceeds under formation of mercaptides, thiomercaptides (RS_2Me), and

149T34

USSR/Chemistry - Thiols (Contd)

Aug 49

dithiomercaptides (HS_2Me). Obtained thiomercaptides in form of salts of heavy metals. Studied several of their properties. Action on arylthiomercaptides on halogen-substituted nitro-compounds with different radicals did not produce complex disulfides $R_1S - SR_2$, as expected, but a mixture of two simple ones. Studied reducing action of mercaptides and thiomercaptides on (complex) disulfides. Cites 2,2'-dinitrodiphenyltrisulfide as example of instability of compounds of this type. Depending on conditions of the reaction, they can undergo either reductive cleavage of desulfidation. Submitted 12 Mar 48.

149T34

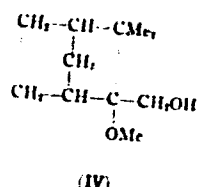
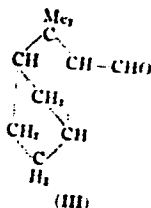
CA

Sulfide compounds of the aromatic series. V. O. Lukashovich and M. M. Sergeeva. *Zhur. Obshch. Khim.* (J. Gen. Chem.) 19, 1403-1510 (1949); cf. C.A. 44, 1921g.—Reductive cleavage of Ar_2S_2 by alkali sulfides yields $RSNa$, RS_2Na , and RS_3Na . Ar_2S_2Na in their reactions with nitrohalogen derivs. yield not the mixed disulfides but mixts. of sym. disulfides, R_2S_2 and R'_2S_2 , probably via decompn. reactions induced by RS and RS_2 ions. Satn. of half a soln. of 8-10 g. $NaOH$ in 200 ml. $EtOH$ by H_2S until neutral to phenolphthalein, removal of the excess H_2S with a N stream, and addn. to the remainder of the alc. $NaOH$ yields pure $NaSH$; Na_2S treated with the calcd. amt. of S yields pure Na_2S_2 in pure state if the reaction is run at 60° in $EtOH$; Na_2S_2 is made by soln. of S in alc. $NaSH$ at 45° ; Na_2S_2 , which must be used immediately because of poor stability, is prepd. by addn. of hot $PhMe$ (100 ml.) contg. 2.2 g. S to 1 g. Na in boiling $MePh$, boiling 0.25 hr., cooling, filtration, and evapn. in vacuo. The products may be readily analyzed by Na_2SO_3 treatment, followed by pptn. of the sulfide with Pb and volumetric titration of the filtrate. Na_2S_2 (0.87 g.) in 10 ml. $EtOH$ added at 0° to 1.68 g. $o-C_6H_4(NO_2)_2$ in $EtOH$ and let stand 1.5 hrs. gave 0.5 g. S and 0.9 g. pure 2,2'-dinitrodiphenyl disulfide (I), after washing with CS_2 . Alc. Na_2S_2 (0.55 g.) added at 5° to 0.84 g. $o-C_6H_4(NO_2)_2$ in $EtOH$, let stand 0.5 hr., and oxidized by addn. of alc. iodine similarly gave 0.8 g. I , m. $195-6^\circ$ (from Me_2CO), formed by oxidation of the intermediate RS_2Na ; the tetrasulfide reported by Blankenship [*Rec. trav. chim.* 20, 13, 144 (1901)] was not detected. $o-$

$C_6H_4(NO_2)_2$ (2 moles) with 1 mole Na_2S_2 in $EtOH$ at 25° yields almost 100% of the RS_2 deriv., m. $194-5.5^\circ$; the reaction may be run in 2 steps by portionwise addn. of $C_6H_4(NO_2)_2$, when a 94% material balance of RS_2 , unreacted $C_6H_4(NO_2)_2$, and o -nitroaniline may be secured. An equimol. mixt. of 2,4-(O_2N) $_2C_6H_3Cl$ and Na_2S_2 in $EtOH$ at 20° in 5-6 min. yields 80% 2,2',4,4'-tetranitrodiphenyl disulfide (II), decomp. above 280° , if a 2nd mole of (O_2N) $_2C_6H_3Cl$ is added and the soln. let stand overnight. Similarly, 3.4 g. $o-C_6H_4(NO_2)_2$ and 2.2 g. Na_2S_2 in $EtOH$ after 5 min. standing, addn. of 4.1 g. 2,4-(O_2N) $_2C_6H_3Cl$, and standing overnight, gave 4.1 g. II after washing with hot Me_2CO ; the soln. yielded 1.1 g. I. p - $BrC_6H_4NO_2$ (4.04 g.) and 2.2 g. Na_2S_2 in 90 ml. $EtOH$ mixed at 45° and let stand 100 min., then treated with 4.1 g. 2,4-(O_2N) $_2C_6H_3Cl$ and kept 1 hr. at 45° , gave 2.8 g. II and 1 g. (p - $O_2NC_6H_4$) $_2S_2$. Alc. p - $O_2NC_6H_4S_2Na$, let stand in the dark 3 days, deposits S and yields $RSNa$; in the presence of o -nitroanisole, the reaction is unchanged and no reduction products of nitroanisole are formed. Chlorination of 20 g. I in CCl_4 yields 13-14 g. o - O_2N - C_6H_4SCl , yellow needles, m. 75° . Addn. of 4 g. Na_2S in 60 ml. $EtOH$ to 10.5 g. p - $BrC_6H_4NO_2$ in 100 ml. hot $EtOH$, diln. after 20 min., and filtration into 17% HCl gave 60% p - $O_2NC_6H_4SH$, m. 75° ; the o -analog, prepd. similarly at 40° in 25-30% yield, m.p. not given; 2,4-(O_2N) $_2C_6H_3SH$, prepd. similarly at 25° in 90% yield, m. 131° . Oxidation of 22 g. $PhSH$ in 20% $NaOH$ by 3.8 g. K ferricyanide gave 100% PhS_2 , m. $60-1^\circ$ (from $EtOH$). p - $O_2NC_6H_4SH$ (3.1 g.) and 3.8 g. o - $O_2NC_6H_4SCl$ in Et_2O gave 18% 2,4'-dinitrodiphenyl disulfide, m. $159.2-9.6^\circ$ (from $Et_2O \cdot CHCl_3$); similarly, 2,4-(O_2N) $_2C_6H_3SH$ gave

6.5 g. Bu ether, b_p 111-13°, d_4^{20} 0.9023, n_D^{20} 1.4726. Iso-PrOH gave, from 15 g. oxide, 4.2 g. iso-Pr ether, b_p 104-6°, d_4^{20} 0.9715, n_D^{20} 1.4737, as well as 4.4 g. unsatd. aldehyde, $C_{11}H_{18}O$, b_p 74-6°, d_4^{20} 0.8320, n_D^{20} 1.4711, contg. 1 double bond and identical with the isomerization product of carene oxide by $ZnBr_2$; semicarbazone, m. 210-17° (from BuOH contg. 0.4 g. H_2SO_4 gave a vigorous reaction which was completed on the steam bath (0.5 hr.) and after neutralization by RONA gave a series of fractions from which were isolated 7.5 g. of the above aldehyde, as well as small amts. of unidentified products. Heating 10 g. carene oxide in 26 g. CaH_2 with 0.7 g. H_2SO_4 , followed by hyde (crude), from which was obtained 3.2 g. pure substance. Addn. of 27.5 g. carene oxide to 230 ml. abs. EtOH, 0.4 g. H_2SO_4 , and 25.5 ml. of soln. of 16.67 g. AcOH in AcOH and standing overnight gave a series of products from which was obtained, after treatment with

H_2O_2 and hydrolysis of the crude borate ester, 5.1 g. carene glycol mono-Et ether, b_p 103-4°, d_4^{20} 0.9455, n_D^{20} 1.4753, as well as 1.8 g. carene glycol monohydrate, m. 73-5° (from moist gasoline). Camphene oxide (from camphene and AcOH in EtO), m. 86-8°, $[\alpha]_D^{20}$ 16.82° (EtOH), (25 g.) in 12 g. MeOH added to 21 g. MeOH contg. 0.3 g. H_2SO_4 , followed by neutralization with MeONa, gave a series of products from which was isolated 14.5 g. $C_{11}H_{18}O_2$ (II), b_p 103-5°, n_D^{20} 1.4634, d_4^{20} 0.9700; since hydrolysis by 8% HCl gave camphenyl aldehyde (III), m. 63-5° (semicarbazone, m. 160-1°), II was the di-Me acetal of III; in addn. there was also isolated a small amt. of a substance $C_{11}H_{18}O_2$, b_p 113-20°, m. 84°, contg. 1 OH group, which is apparently IV, as it is esterified by heating with H_2CO_3 in vacuo and the product is readily hydrolyzed to the original substance.



G. M. Kosolapoff

LUKASHEVICH, V. O.

USSR/Chemistry - Organic Compounds
Chemistry - Rearrangements

Mar 49

"Peculiarities in Regrouping Hydrazo Compounds of the Napthalene Series," L. G. Krol'k, V. O. Lukashevich, Sci Res Inst Org Intermediate Products and Dyestuffs, 4 pp

"Dok Ak Nauk SSSR" Vol LXV, No 1

Meisenheimer and Witte, reducing 2,2' -azonaphthalene with zinc dust in an alcoholic alkali solution, discovered that 2,2' -diamino--1,1' -dinaphthyl forms along with the hydrazo compound. Authors attempt to clarify explanation of this phenomenon. Submitted by Acad B. A. Kazanskiy, 5 Jan 49.

PA 29/49T11

PA 1/50T18

LUKASHEVICH, V. O.

USSR/Chemistry - Sulfur Compounds
Thiols (Mercaptans)

Aug 49

"Some Reactions in Sulfur Compounds of the
Aromatic Series," V. O. Lukashevich, M. M.
Bergeyev, Sci Res Inst of Org Intermediate
Products and Dyestuffs Imeni K. Ye. Voroshilov,
3 1/2 pp

"Dok Ak Nauk SSSR" Vol LXVII, No 6

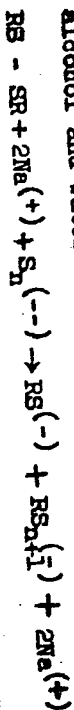
Initially gives three formulas expressing the
reaction of diaryl-disulfides with sulfurous
metals to form corresponding mercaptans of the
aromatic series. On the basis of them, authors

1/50T18

USSR/Chemistry - Sulfur Compounds
(Contd)

Aug 49

advance the following diagram for reactions in
alcohol and water-alcohol solutions.



Suggests experiments were then performed with
KagB and Na_2S_2 and the results expanded for
the formation of numerous derived compounds.
Submitted by Acad V. M. Rodionov, 23 Jun 49.

1/50T18

CA

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Some reactions of aromatic compounds of sulfur. V. O. Lukashyich and R. S. Chlenova. *Doklady Akad. Nauk S.S.S.R.* 73, 711-14 (1950).—Chloronitronaphthalenes were treated in MeOH in a N atm. with alc. Na₂S. With 1,4-ClC₆H₄NO₂, the reaction was completed in 8 hrs. at 20°, the 1,2-isomer required 4 hrs., and the 2,1-isomer required

12 hrs. at 40°. Acidification of the dil. solns. yielded yellowish mercaptans, purified by reprecipitation. 4-Nitro-1-naphthyl mercaptan (I), m. 77-80°; 2-nitro-1-naphthyl mercaptan (II), m. 70-73°; 1-nitro-2-naphthyl mercaptan (III), m. 98-100°. While these oxidized rapidly on exposure to air in EtOH solns., their mercaptides are comparatively stable. I let stand in EtOH for some time gave a ppt. of pure bis(4-nitro-1-naphthyl) sulfide (IV), m. 235-7°, and H₂S evolution occurred even without access of air. The mercaptan (1.64 g.) in 125 ml. MeOH with 0.32 g. NaOH (i.e., RSNa) gave after 14 days at room temp. under N a ppt. of the disulfide; the filtrate from this was either oxidized in alk. medium with ferricyanide, when the mercaptide still in soln. yielded the sulfide, or oxidized with H₂O₂ in alk. soln. with subsequent removal of the disulfide and pptn. of SO₄ by Ba. In all, 69.8% sulfide, 29.1% disulfide, and 72.8% Na₂S could be accounted for. Hence, the Na salt of I reacts in the absence of extraneous oxidants according to 2RSNa = R₂S + Na₂S. The Na salt of II is more stable

and in a similar expt. 96% original substance was recovered. The Na salt of I with RX of sufficient reactivity readily gave, in MeOH, 4-nitro-1-naphthyl 2,4-dinitrophenyl sulfide, m. 192-3.5°, with 2,4-(O₂N)₂C₆H₃Cl, and the 2-nitrophenyl analog, m. 156-7°, with o-O₂N-C₆H₄Cl. With 2,1-ClC₆H₄NO₂ as the 2nd reactant, 16 hrs. at 60° gave much unreacted Cl compl. and 36% IV, obviously formed by the reaction illustrated above. An authentic specimen of 4-nitro-1-naphthyl p-nitrophenyl sulfide, m. 147-8.5° (from ligroin), was obtained from 2.12 g. p-O₂N-C₆H₄SH and 2.9 g. 1,4-ClC₆H₄NO₂ in 180 ml. MeOH in the presence of the theoretical amt. of NaOH let stand overnight at room temp.; the product, m. 236-8°, given the above structure by Hodgson and Leigh (*C.A.* 32, 74129), is IV. III and II with 2,4-(O₂N)₂C₆H₃Cl in MeOH yielded 100% 1-nitro-2-naphthyl, m. 234.5-35.0°, and 2-nitro-1-naphthyl 2,4-dinitrophenyl sulfides, m. 199-201°. The Na salts of I-III were prepd. from Na₂S₂ and the corresponding O₂NC₆H₄Cl (for method cf. *C.A.* 44, 1921g); the most stable was that of III; that of I was less stable, while that of II was destroyed completely in 1 hr. at room temp. after mixing 2,1-O₂NC₆H₄Cl in MeOH with Na₂S₂ as 49% of the total S pptd. from soln. The reason for Hoogewegen's (*C.A.* 25, 2715) isolation of (2,1-O₂NC₆H₄)₂S instead of R₂S₂ is thus explained. Heating p-ClC₆H₄OH or 1,2,4-C₆H₃Cl₃ with S₂Cl₂ gave extremely smooth synthesis of bis(5-chloro-2-hydroxyphenyl) and bis-(2,4,5-trichlorophenyl) trisulfides, resp. Heating diaryl sulfides with S failed to yield the corresponding trisulfides when C₆H₆ was used as solvent. However, addn. of 12 ml. MeOH to 0.5 g. (2,4,5-Cl₃C₆H₂)₂S₂ in 10 ml. C₆H₆ and equimolar amt. of S in 2.5 ml. C₆H₆ immediately gave a ppt. of pure diaryl trisulfide, m. 161-2°; similarly made were the bis(2,5-dichlorophenyl), m. 138-4°, and the bis(2,5-dibromophenyl) trisulfide, m. 164-5°. Mercaptans react similarly with S, yielding trisulfides. Polyhaloaryl sulfides react with Hg at room temp.; in this manner were prepd. Hg 2,5-dichlorophenylmercaptide, m. 251-2°, and the 2,4,5-tri-Cl, m. 280-2°, and penta-Cl analog, m. about 260°. G. M. Kosolapoff

LUKASHEVICH, V. O.

Chem Abs

V. 48 25 Jan 54

Organic Chem

✓ Action of methyl iodide on hydrazobenzene. L. K. Krolk and V. O. Lukashevich. *Doklady Akad. Nauk S.S.S.R.* 87, 229-32 (1953); *Ch. Pongratz, et al., C.A.* 40, 6068. —Powd. (PhNH)₂ (2.34 g.) let stand at room temp. in 80 g. MeI 5 days gave 2.352 g. colorless product (I), m. 146-50°, while the filtrate on evapn. gave 1.065 g. (PhN):₂, m. 67°. I treated with aq. alkali yields PhNH₂, but when heated dry it forms PhNMe₂. I agrees in compn. with C₆H₅N₂I, but its mol. wt. (cryoscopic) is 114-22. Although apparently homogeneous, I is readily sepd. into components by crystn. from EtOH, yielding a product, C₆H₅N₂I, m. 210° (see P. above), identified as PhNMe₂I. The mother liquor yields PhNH₂.HI. When crude I was made alk. in aq. medium and PhNH₂ extd. with C₆H₆, while the neutralized aq. layer was evapd., the quantitative detn. of the components showed that I consists of 2 moles PhNH₂.HI and 1 mole PhNMe₂I. Thus (PhNH)₂ forms a 2:1 mixt. of (PhN):₂ and PhNH₂, the latter yielding PhNMe₂I and PhNH₂.HI. If 2.9 g. PhNH₂ and 90 g. MeI are let stand 7 days at 0° the ppt. (7.25 g.) m. 147-50° and contains 96% PhNMe₂I and 95% PhNH₂.HI (isolated as BzNHPh); traces of PhNMe₂ are found in the filtrate; treatment of PhNH₂ with PhNMe₂.HI in a test reaction run in C₆H₆ resulted in almost complete binding of the HI by PhNH₂. In several expts. with (PhNH)₂ and MeI the results were anomalous although the same materials and technique were used (the yield of ppt. was low and the PhNH₂.HI content higher than given above). G. M. Kosolapoff

Chem 4

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MF 7-27-54

LUKASHEVICH, V. O.

FD 193

USSR/Chemistry - Dyestuff Intermediates

Card 1/1

Authors : Orlova, T. I., Lukashevich, V. O.

Title : Reactions which complicate the synthesis of acetoacetic acid
arylamides

Periodical : Khim. prom. 4, 21-25 (213-217), June 1954

Abstract : Describes a detailed investigation of the preparation of acetoacetic acid arylamides under various conditions with the aim of finding the best procedure for industrial application. Established that while the enol content has no influence on the yield, even traces of acid are harmful, because they expedite the formation of ethyl crotonate. Recommends addition of non-volatile and non-reacting organic bases to the initial mixture of ethyl acetoacetate and arylamine. One USSR reference (1947), 25 foreign references.

LUKASHEVICH, V.O.

USSR/Scientists - Chemistry

Card 1/1 : Pub. 151 - 37/37

Authors : Rodionov, V. M.; Vorozhtsov, N. N.; Smirnova, A. F.; Shchetinina, L. A.;
Shestov, A. P.; Korolev, A. I.; Lukashevich, V. O.; and Ufimtsev, V. N.

Title :
In memory of Evgeniy Alekseevich Ivanov

Periodical : Zhur. ob. khim. 24/3, 579-580, Mar 1954

Abstract : Eulogy is presented honoring the passing of E. A. Ivanov, chief of the
Central Laboratory of the Dorogomilov-Frunze Chemical Plant, scientist
in the field of organic semi-products and dyes, recipient of Stalin
premium. Illustration.

Institution:

Submitted :

USSR/Chemistry - Benzene sulfonation

Card 1/1 Pub. 22 - 29/63

Authors : Lukashevich, V. O.

Title : Sulfonation of halogeno substitutes of benzene; formation of anhydrides of homologous sulfo-acids

Periodical : Dok. AN SSSR 99/6, 995-998, Dec 21, 1954

Abstract : The difficulties involved in the derivation of sulfo-acids through the sulfonation of halogeno substitutes of benzene are explained. The method of using polychlorobenzene and polybromobenzene of highly concentrated oleum was found to be unreliable. The method of sulfonation with greater surplus of oleum of modest concentrations brought more satisfactory results. Data, regarding the desulfurization of halogeno substitutes of benzene, are presented. Six references: 4-German; 1-USA and 1-French (1876-1949). Table.

Institution: The K. E. Voroshilov State Scientific Research Institute of Organic Semi-Products and Dyes

Presented by: Academician B. A. Kazanskiy, September 1, 1954

LUKASHEVICH, V. O.
SH

USSR/Organic Chemistry - Synthetic Organic Chemistry, E-2

Abst Journal: Referat Zhur - Khimiya, No 19, 1956, 61508

Author: Lukashovich, V. O.

Institution: None

Title: Action of HBr on Sulfonic Acid Anhydrides; Preparation of Diaryl-disulfides and Arylsulfobromides

Original

Periodical: Dokl. AN SSSR, 1955, 103, No 4, 627-630

Abstract: Interaction of sulfonic acid anhydrides (SA) with HBr in glacial CH_3COOH results in formation of corresponding diaryldisulfides (DS) and takes place according to the scheme: $(\text{RSO}_2)_2\text{O} + \text{HBr} \rightarrow \text{RSO}_2\text{Br}(\text{SB}) + \text{RSO}_3\text{H}$; $2\text{RSO}_2\text{Br} + 8\text{HBr} \rightleftharpoons \text{RSSR} + 10\text{Br} + 4\text{H}_2\text{O}$. On binding the Br (with phenol) it is possible to prepare the SA. On the other hand by using CH_3COONa to remove HBr it is possible to prevent formation of DS and obtain the SB with a yield of 80-85%. DS can also be prepared by treating with a solution of HBr in glacial CH_3COOH the sulfochlorides (SC). This permits to obtain in the presence of

Card 1/3

USSR/Organic Chemistry - Synthetic Organic Chemistry, E-2

Abst Journal: Referat Zhur - Khimiya, No 19, 1956, 61508

Abstract: phenol readily brominated DS, $R = C_6H_5$ and naphthyl-2 (in the absence of phenol are formed DSR = 4-Br C_6H_5 and R = 1-bromonaphthyl-2), and also nitro and polyhalogen derivatives of DS. Moreover SC (in absence of phenol) can be converted into the corresponding SBr. On heating for 30 minutes of SA with glacial CH_3COOH at 70-80° there takes place transanhydridization, heating of SA with a solution of HCl in CH_3COOH causes the formation of SC (15-20 minutes, 70-80°, yield 50%). 0.0035 mol SA added to solution of 0.0175 mol HBr in 15 ml glacial CH_3COOH , heated 20-30 minutes at 70-75°, on cooling DS filtered off, washed with 85% CH_3COOH from filtrate separates on dilution with water the SB. The results listed below refer to state of equilibrium (listing R in SA, yield of DS and SB in %): 2,5-Cl $_2C_6H_3$, 15.2, 78.4; 2,4,5-Cl $_3C_6H_2$, 71.2, 17.0; 2,3,5,6-Cl $_4C_6H$, 85.6, --; 4-Br C_6H_4 , 14.1, 74.2; 2,5-Br $_2C_6H_3$, 57.8, 27.1; 4-JC $_6H_4$, 53.0, 36.5. On adding after completion of reaction and cooling of mixture 0.02 mol of CH_3COONa , there is obtained SB with a yield of 80-85% (separates on dilution with water); under the same conditions in the presence of phenol (0.5 g) DS are obtained with yields of 85-90%. 0.01 mol SC heated

Card 2

USSR/Organic Chemistry - Synthetic Organic Chemistry, E-2

Abst Journal: Referat Zhur - Khimiya, No 19, 1956, 61508

Abstract: with solution of 0.06 mol HBr and 0.011 mol phenol in 50 ml glacial CH_3COOH at 55-60°, 20-30 hours, after cooling on dilution with water DS³ is obtained; to prepare SB the reaction is carried out in absence of phenol, on completion heated until DS is dissolved, rapidly cooled to 20° and within a few minutes added 0.03 mol CH_3COONa , shaken 15-30 minutes until colorless, separate NaBr and diluted with water (listing R in 3C, yield DS in %, MP °C, yield of SB in %, MP °C): C_6H_5 , 80, 60-61, 77.3, liquid; 4- $\text{CH}_3\text{C}_6\text{H}_4$, 84.5, 44.5-77.2, 95-96; 4- ClC_6H_4 , 87.6, 71-72, 80.2, 55.5-56.5; 2,5- $\text{Cl}_2\text{C}_6\text{H}_3$, 94.3, 81.5-82, 87.0, 73-74; 2,4,5- $\text{Cl}_3\text{C}_6\text{H}_2$, 94.8, 146.5-147.5, 83.4, 84.5-85.3; 2,3,5,6- $\text{Cl}_4\text{C}_6\text{H}$, 95.6, 138-139, --, --; Cl_5C_6 , 98.0, 235-237, --, --; 4- BrC_6H_4 , 94.6, 93, 54-94, 86.5, 76-77; 2,5- $\text{Br}_2\text{C}_6\text{H}_3$, 93.8, 112-113, 86.4, 114-115; 4- IC_6H_4 , 92.7, 124.5-125.5, 79.0, 97-98; 2,5- $\text{I}_2\text{C}_6\text{H}_3$, 92.9, 157.5-158.5, 77.0, 125; 3- $(\text{NO}_2)\text{C}_6\text{H}_4$, 90.0, 82-82.5, 78.0, 66.5-67.5; 4,5- $(\text{NO}_2)\text{C}_6\text{H}_3$, 93.5, 86-86.7, 82.2, liquid; 2,5- $\text{Cl}(\text{NO}_2)\text{C}_6\text{H}_3$, 93.0, 143-143.5, 87.6, 91.5-92.5; 4,5- $\text{Cl}(\text{NO}_2)\text{C}_6\text{H}_3$, 90.0, 116-117, 80.6, 59-60, naphthyl-2, 83.0, 140-141, 75.0, 96-97.

Card 3/3

LUKASHEVICH, V. O.

Problems of sulfonation in the aromatic series. V. O. 3
 Lukashovich (K. P. Voroshilov Org. Internat. Dye Inst.
 Moscow). Doklady Akad. Nauk S.S.S.R. 112, 872-4 (1957). 424j-1

Sulfonation of aromatic compounds was performed by adding to ClSO_3H over 1 hr. of the desired compound at 0° to -8° and after 1.5-3.5 hrs. quenching in ice. The main products derived from C_6H_6 , PhCl , PhBr , PhI , p -, m - and o - $\text{C}_6\text{H}_4\text{Cl}_2$, and o - and m - $\text{C}_6\text{H}_3\text{Br}_2$ were sulfonic acids (41-66%) and sulfones (up to 41.5%) with generally 16-20% sulfonyl chlorides, which are the products of secondary reaction of RCl_2H with ClSO_3H . Keeping RCl_2H 1 hr. with excess of

sulfones (up to 41.80% with generally 16-20% sulfonyl chlorides, which are the products of secondary reaction of HSO_3H with ClSO_3H). Keeping RSO_3H 1 hr. with mols. of $\text{H}_2\text{SO}_4\text{-ClSO}_3\text{H}$ at 15° to -8° gave 45-55% RSO_2Cl . Since relatively large yields of sulfones are formed at low temp. in the very beginning of the reaction, it is suggested that the reaction proceeds by formation from ArSO_3H and ClSO_3H of anhydrides $\text{RSO}_2\text{OSO}_3\text{H}$, which react in 2 ways: with ClSO_3H to yield ArSO_2Cl and ClSO_3H , and with H_2O to yield the sulfones. Since free sulfonic acid apparently destroys the anhydrides this provides an explanation for lowered yields of RSO_2Cl and sulfones on increase of concn. of H_2SO_4 in the reaction mixt. The yields of RSO_2Cl also decline when one employs for the reaction ClSO_3H contg.

Lukashевич, V.O.

(dissolved HCl (0.4%)) - prevents formation of sulfones in
alkylation with olefins. In the presence of HCl the reaction
of olefins with SO_2 is inhibited. The reaction
results in low max. yield of RSO_2Cl in a few min. Thus,
0.02 mole δ - C_6H_5Cl , added in 2 min. to 0.1 mole $ClSO_3H$
and 60% olefin (0.03 mole SO_2) at 0° resulted in temp. rise
to 22° ; after 10 min. the mixt. was quenched with ice
yielding MSO_2Cl and MSO_2H and the reaction was over. The
temp. at first point of the reaction was 0° and at the
end of the reaction it was 22° .

124E43

G. M. Kosolapoff

am. wh.

LUKASHEVICH, V.O.

20-5-30/60

**AUTHOR
TITLE**

LUKASHEVICH, V.O.

The Action of Inorganic Acid Chloranhydrides on Aryl-sulphonic Acids. A General Method for the Production of Anhydrides from a Reaction of arylsulphonic Acids with P_2O_5 . (Deystviye khlorangidridov neorganicheskikh kislot na arilsul'fokisloty. Obshchiy metod pulucheniya angidridov reaktsiye arilsul'fokislota s P_2O_5 . - Russian) Doklady Akademii Nauk SSSR 1957 Vol 114, Nr 5, pp 1025-1028 (U.S.S.R.)

PERIODICAL

ABSTRACT

It is well known that the most widely used methods for the conversion of arylsulfonic acids into sulfochlorides are based on the treatment of the sodium or potassium salts of sulfonic acids with phosphorus pentachloride, more seldom with phosphorus oxychloride. With chloro sulfonic acid a direct influence is usually exerted upon non-sulphited substances. Among other chloroanhydrides, e.g. PCl_3 , $SOCl_2$, $COCl_2$ one's attention is drawn to thionyl chloride, as far as action results are concerned. From boiling this substance with sulfonic acids there often result, according to Hans Meyer, sulfonic acid anhydrides beside sulfochlorides or their salts, respectively.

CARD 1/4

20-5-30/60

The Action of Inorganic Acid Chloranhydrides on Aryl-sulphonic Acids. A General Method for the Production of Anhydrides from a Reaction of arylsulphonic Acids with P_2O_5 .

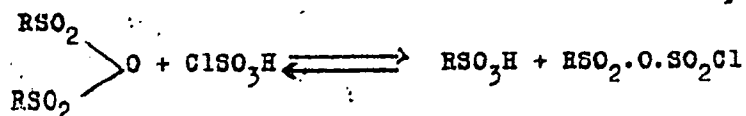
According to published data it is in some instances possible that anhydrides are obtained from the interaction of sulfonic acids with phosphorus pentachloride. From the investigations of the author it is clear that this is a sufficiently wide-spread phenomenon. Tab.1 records the results of this reaction for several compounds. The author found that the sulfonic acid anhydrides develop already before treatment of the reaction mixture with water. Moreover, they hardly change on the occasion of a short-time influence of PCl_5 mixed with $POCl_3$. Finally, under these conditions, a formation of the same anhydrides through influence of sulfochlorides on sulfonic acids or their salts, respectively, seems to be possible, on this basis a mechanism of formation is proposed. The "peranhydration" process passing the corresponding mixed anhydrides, is represented by systems. The author asks himself the question whether sulfonic acid anhydrides can be produced by interaction of sulfonic acids with chloro sulfonic acid. He had recently demonstrated that from the first step of this interaction also mixed

CARD 2/4

20-5-30/60

The Action of Inorganic Acid Chloranhydrides on Aryl-sulphonic Acids. A General Method for the Production of Anhydrides from a Reaction of arylsulphonic Acids with P_2O_5 .

anhydrides are obtained. Very readily they further react with chlorosulfonic acid and for this reason, special cases excepted, their accumulation is impossible. A double course of this process is indicated. In the first instance half of the anhydride should be converted to sulfochloride, that is immediately after dissolution of the anhydride in $ClSO_3H$ -express. According to the author's observations, sulfonic acids corresponding to the anhydrides react more slowly with $ClCO_3H$ than the former. The problem was solved experimentally and the followings system found to be correct:



CARD 3/4

20-5-30/60

The Action of Inorganic Acid Chloranhydrides on Aryl-sulphonic Acids. A General Method for the Production of Anhydrides from a Reaction of arylsulphonic Acids with P_2O_5 .

Further a case is mentioned from publications, which describes the formation of the anhydride of p-benzene-disulfonic acid from a reaction of chlorosulfonic acid with the dipotassium salt of the former acid at $120^{\circ}C$. Finally the method for the production of anhydrides in chloroform and their properties are described.
(1 Slavic reference)

ASSOCIATION: "K.Ye. VOROSHILOV" scientific research institute for organic semi-products and dyes.
(Nauchno-issledovatel'skiy institut organicheskikh poluproduktov i krasiteley im. K.Ye. Voroshilova)

PRESENTED BY: B.A. KAZANSKIY, member of the Academy.

SUBMITTED: 23.2.57

AVAILABLE: Library of Congress.

CARD 4/4

SOV/ 20-120-2-25/63

AUTHORS: Lukashevich, V. O., Krolik, L. G.

TITLE: The Disproportionation of Hydrazo Compounds on Heating With Amine Salts and Weak Acids (Disproportsionirovaniye gidrazosoyedineniy pri nagrevanii s solyami aminov i slabymi kislotami)

PERIODICAL: Doklady Akademii Nauk SSSR, 1958, Vol. 120, Nr 2, pp.316-319 (USSR)

ABSTRACT: As is well known the above-mentioned compounds of the benzene series decompose on moderate heating (100-150°C) in a protective gas and almost exclusively yield disproportionation products. Examples of the authors' own practice are given (table 1). It was possible to them to prove that the disproportionation of the hydrazo compounds is suddenly accelerated in the presence of hydrochloric acids of amino compounds. When the amount of aniline-chlorhydrate is reduced to 10 % of the molar concentration the decomposition of hydrazobenzene takes place more slowly, but still amounts to somewhat above 80 % after 1 hour of heating (experiment Nr 2, table 1). On stronger heating (140-160°C) the partly resinified mass con-

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SOV/20-120-2-25/63

The Disproportionation of Hydrazo Compounds on Heating With Amine Salts
and Weak Acids

tains much larger amounts of the regrouping products, among them also about 2 % benzidine. The influence of benzidine-dichlorhydrate and aniline-chlorhydrate upon hydrazobenzene is almost equal; benzidine-monochlorhydrate, due to its weaker dissociation, acts much more weakly (experiment Nr 5, table 1). By utilizing the fact that benzidine, aniline and benzidine-chlorhydrate form a number of compounds the basicity of which consequently decreases the authors succeeded in obtaining the comparatively hard accessible benzidine-monochlorhydrates and their analogues. This was possible by the influence of aniline upon the dichlorates of these bases in aqueous solutions. The yields amounted to 85-90 % of the theoretically possible. The mechanism of reaction is described. If taking into account the individual peculiarities of the other hydrazo compounds it can be stated that on the whole they will follow the example of hydrazobenzene (table 1). It can hardly be doubted that in these cases the process also takes place in 2 stages: the obtained mono-proton hydrazo compound, without having had time to regroup under the influence of a weak acid, undergoes an oxidative-reductive conversion (equation (2)). In connection with this the authors

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SOV/ 20-120-2-25/63

The Disproportionation of Hydrazo Compounds on Heating With Amine Salts
and Weak Acids

want to prove how large the disproportionation of some hydrazo compounds is in the regrouping process. This concerns above all the compounds with substituents in a para-position to the hydrazo group; many of them readily react with weak acids (table 2). There are 2 tables and 7 references, 5 of which are Soviet.

ASSOCIATION: Nauchno-issledovatel'skiy institut organicheskikh poluproduktov i krasiteley im. K. Ye. Voroshilova
(Scientific Research Institute of Organic Semiproducts and Dyes imeni K. Ye. Voroshilov)

PRESENTED: January 22, 1958, by B. A. Kazanskiy, Member, Academy of Sciences, USSR

SUBMITTED: January 18, 1958

1. Cyclic compounds--Heating 2. Amines--Applications
3. Acid--Applications 4. Cyclic compounds--Test results

Card 3/3

LUKASHEVICH, V.O.

Reduction of nitro compounds of the aromatic series. Org.
poluprod. i kras, no.1:40-71 '59. (MIRA 14:18)
(Nitro compounds)

LUKASHEVICH, V.O.

Investigation in the field of arylsulfonic acids and relative
substances. Org. poluprod. i kras. no.1:103-112 '59.

(MIRA 14:10)

(Sulfonic acid)

KIV LIL, L.G.; DOMASHNEV, Y.O.

On regrouping of hydrazo compounds. (Eng. polymers. 2 lines.
no.1:130-139 '59. (JMA 14:11)
(Hydrazo compounds)

LUKASHEVICH, V.O.; SERGEYEV, V.P.; CHIRNOVA, R.S.

Investigation in the field of sulfides of the aromatic series.
Org. poluprod. i kras. no.1:160-167 '59. (MIRA 14:11)
(Sulfides)
(Aromatic compounds)

5(2,3) 5.3610

AUTHORS: Lukashevich, V. O., Krolik, L. G.

00-66
SOV/20-129-1-32/64

TITLE: Investigation of the Rearrangement of Hydrazo Compounds Under the Influence of Nonionized Acids

PERIODICAL: Doklady Akademii nauk SSSR, 1959, Vol 129, Nr 1, pp 117-120 (USSR)

ABSTRACT: The authors first give a description of their experimental results in rearranging hydrazobenzene (I), 2,2'-dimethylhydrazobenzene (II), and 2,2'-dimethoxyhydrazobenzene (III) under the influence of dry HCl and HBr in ether, benzenetoluene mixture (BTG) and without solvent (Table 1). The experimental method is described. On the rates of rearrangement. These rates often differ considerably from each other in the presence of nonionized acids and so greatly exceed those in aqueous-alcoholic solutions that comparison becomes difficult. For the purpose of orientation several values with regard to (I), (II), and 2,2'-dichlorohydrazobenzene (IV) are given (Table 3). All experiments were carried out in 95% alcohol at 1-0° C. In non-ionized state HBr reacts as a much stronger acid than HCl: The rates of rearrangement induced by HBr are 100,000 times higher than those of HCl. Only results in ethereal solutions

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66486

Investigation of the Rearrangement of Hydrazo Compounds SOV/20-129-1-32/64
Under the Influence of Nonionized Acids

(experiments Nr 2 and Nr 4) or in BTG (experiments Nr 11 and Nr 12) are comparable. On the salts of hydrazo compounds (Ref 1). The ethereal solutions of halogen hydracids may be considered equilibrium systems. Since the acidity of HX is decreased (see (1)) due to intermolecular interaction, it is easy to prepare salts of a number of hydrazo compounds in ether (Table 3). These salts containing substituents in the positions 3- and 3,3'- of the hydrazo group are comparatively stable whereas the 2,2'- and 4,4'- substituted ones do not form stable salts (except 4-chlorohydrazobenzene). On the basicity of hydrazo compounds. The basicity of any of these compounds may be compared to that of chloranilines. Basicity of hydrazobenzene, for example, is somewhat stronger than that of 2,5-dichloroaniline. Hydrazo compounds with less basicity may be compared with pentachloroaniline. Basicity of 2,2'-dichlorohydrazobenzene is much weaker than that of pentachloroaniline. On the mechanism of rearrangement. The authors proved by several examples that the salts of hydrazo compounds almost exclusively undergo redox transformation in the absence of considerable

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66486

Investigation of the Rearrangement of Hydrazo Compounds SOV/20-129-1-32/64
Under the Influence of Nonionized Acids

excess of acid (2). Consequently, a second acid molecule has to take part in rearrangement. Special experiments proved that the salts of aliphatic-aromatic hydrazines are very weak bases. The authors consider most probable a mechanism caused by intermolecular interaction (hydrogen bond ?) of the polar molecules of the salt resulting from the hydrazo compound and the acid; equilibrium between the polar molecules is established at ionic reaction rates. There are 3 tables and 6 references, 3 of which are Soviet.

ASSOCIATION: Nauchno-issledovatel'skiy institut organicheskikh poluproduktov i krasiteley im. K. Ye. Voroshilova (Scientific Research Institute of Organic Intermediates and Dyes imeni K. Ye. Voroshilov)

PRESENTED: June 26, 1959, by B. A. Kazanskiy, Academician

SUBMITTED: June 24, 1959

Card 3/3

LUKASHEVICH, V.O.

Double protonation of hydrazo compounds does not take place
in the course of rearrangement. Dokl.AN SSSR 133 no.1:
115-118 J1 '60. (MIRA 13:7)

1. Institut organicheskikh poluproduktov i krasiteley imeni
K.Ye.Voroshilova. Predstavleno akademikom B.A.Kazanskim.
(Hydrazo compounds) (Protons)

KROLIK, L.G.; LUKASHEVICH, V.O.

Synthesis of *p*-semidine by the action of acid on 1,2'-hydrazonaphthalene. Dokl. AN SSSR 135 no.5:1139-1142 D '60. (MIRA 13:12)

1. Nauchno-issledovatel'skiy institut organicheskikh poluproduktov i krasiteley. Predstavleno akademikom B.A. Kazanskim.
(Hydrazine) (Phenylenediamine)

KROLIK, L.G.; LUKASHEVICH, V.O.

"Thermal" regrouping of hydrazo compounds. Dokl. AN SSSR 139
no.1:110-113 J1 '61. (MIRA 14:7)

1. Nauchno-issledovatel'skiy institut organicheskikh poluproduktov i krasiteley im. K.Ye. Voroshilova. Predstavleno akademikom B.A. Kazanskim.

(Hydrazo compounds)

LUKASHEVICH, V.O.; KROLIK, L.G.

"Thermal" rearrangement of hydrazo compounds in various solvent.
Dokl. AN SSSR 147 no.5:1090-1093 D '62. (MIRA 16:2)

1. Nauchno-issledovatel'skiy institut organicheskikh polupro-
duktov i krasiteley. Predstavleno akademikom B.A. Kazanskim.
(Hydrazo compounds)

LUKASHEVICH, V.O.

Mechanism of rearrangement of hydrazo compounds. Dokl. AN SSSR
199:1095-1098 D '64 (MIRA 18:1)

1. Nauchno-issledovatel'skiy institut organicheskikh poluproduktov i krasiteley. Predstavleno akademikom B.A. Kazanskim.

LUKASHEVICH, V.O.; LISITSYNA, Ye.S.

Planarity of the molecules of diazoamino compounds. Dokl. AN SSSR
160 no.1:129-132 Ja '65. (MIRA 18:2)

1. Nauchno-issledovatel'skiy institut organicheskikh poluproduktov
i krasiteley. Submitted July 2, 1964.

RUDKOV, G.V.; LUKASHEVICH, V.P.

Use of diesel locomotives with hydraulic drive in industrial enterprises. Zhel.dor.transp.44 no.3:75-76 Mr '62. (MIRA 15:3)

1. Nachal'nik reklamatsionnogo byuro zavoda im. F.E.Dzerzhinskogo, g.Murom (for Rudkov). 2. Zamestitel' nachal'nika mekhanosborochnoogo tsekha zavoda im. F.E.Dzerzhinskogo, g. Murom (for Lukashevich).
(Diesel locomotives--Hydraulic drive)(Railroads,Industrial)

I. 46890-66

ACC NR: AR6028075 (N) SOURCE CODE: UR/0124/66/000/005/B057/B057

AUTHOR: Lukashevich, V. P.

TITLE: Integral equations for calculating circular rotating plane grids composed of arbitrary physical profiles

SOURCE: Ref. zh. Mekhanika, Abs. 5B345

REF SOURCE: Tr. Vses. n.-i. konstrukt. i tekhnol. in-ta gidromashinostr.,
vyp. 35, 1965, 89-109

TOPIC TAGS: integral equation, Cauchy formula, circular rotating plane grid

ABSTRACT: Integral equations concerning the velocity and velocity potential on the profile of circular rotating plane grids are derived by means of the Cauchy formula. Integral equations are extended to equations used for straight-line grids. Consideration concerning the numerical solution of these equations with the use of digital computers are presented. Bibliography of 12 titles.
G. Yu. Stepanov. [Translation of abstract] [DW]

SUB CODE: 13/

Card

1/1

LUKASHEVICH, V.T.

Concerning the possibility of building tank farms with surface reinforced-concrete tanks. Transp. i khran. nefiti i nefteprod. no.1:25-27 '65. (MIRA 18:4)

1. Gosudarstvennyy institut po proyektirovaniyu magistral'nykh truboprovodov.

MOLDAVSKIY, O.D. (Moskva); PRONOV, A.P. (Moskva); Prinsipali uchastlye:
VASLYANINA, O.V.; LUKASHEVICH, V.Ya.; KRYGLOVA, Ye.V.

Speed of removal of nonmetallic oxide inclusions in liquid steel. Izv.
AN SSSR. Met. i gor. delo no.5:23-34 S-0 '64.

(MIRA 18:1)

USSR/Cultivated Plants - Technical, Oil, and Sugar Plants.

M-4

Abs Jour : Ref Zhur - Biol., No 3, 1958, 10895

Author : Lukashevich, Ye.

Inst : -

Title : Increasing the Yield of Deccan Hemp.

Orig Pub : S. kh. Kirgizii, 1956, No 4, 11-14

Abstract : No abstract.

Card 1/1

15

USSR/Weeds and Their Control.

N.

Abs Jour : Ref Zhur - Biol., No 15, 1958, 68458

Author : Lukashevich, Ye.

Inst : -

Title : The Control of Dodder in Sowings of Bast Crops.

Orig Pub : S. kh. Kirigizii, 1957, No 8, 49-50

Abstract : To control dodder, which has become wide-spread throughout Kirgiziya in recent years, the author recommends that crops which are easily infested be replaced by those which are more dodder resistant. On the infested areas sudan grass should be sown instead of alfalfa; the former, according to the author's data, gives more hay in three mowings than three mowings of alfalfa in its first year. Deccan hemp should be replaced by ordinary hemp. In addition, early-harvest grains should be included in the rotation as they permit stubble plowing after the harvest as well as early plowing to clean out the weed seeds in the top soil layer. -- V.D. Astaf'yeva

Card 1/1

- 3 -

LUKASHEVICH, Ye. F.

"The Problem of the Pathogenesis of Diabetes Mellitus. (According to Data Obtained from a Study of Alloxan Diabetes in Dogs.)" Cand Med Sci, Kharkov Medical Inst, Min Health Ukrainian SSR Dnepropetrovsk, 1954. (KL, No 1, Jan 55)

Survey of Scientific and Technical Dissertations Defended at USSR Higher Educational Institutions (12)
SO: Sum. No. 556, 24 Jun 55

NOVIKOVA, A.A.; LUKASHEVICH, Ye.F.

Change in water-soluble muscle proteins after removal of
a hemostatic tourniquet. Vop. med. khim. 9 no.1:16-19
Ja-F '63.

(MIRA 17:6)

1. Kafedra biokhimii Dnepropetrovskogo meditsinskogo instituta.

LUKASHEVICH, Ye.S., kand. sel'khoz. nauk; GURIN, V.D., red.

[Hemp as a high-profit crop] Konoplja - vysokodozhdatnaia
kul'tura. Franze, MOKh Kirgizskoi SSR, 1961. 13 p.
(MIRA 17:10)

CO LUKASHEVICH- DUVANOVA, YU. T. 9

Method for determining slag inclusions in steel. Yu. T. LUKASHEVICH- DUVANOVA
Soborniki Vsesoyuznogo Inst. Metal. 1931, Nos. 1-2, 70-4. Schneider's Hf
method and Dickenson's HNO₃ method are checked and neither is found satisfactory
S. I. MADONARV

ASB-3LA METALLURGICAL LITERATURE CLASSIFICATION

1ST AND 2ND ORDERS																										3RD AND 4TH ORDERS																									
PROCESSES AND PROPERTIES INDEX																										PROCESSES AND PROPERTIES INDEX																									
<p>02</p> <p>Determination of slag inclusions in siliceous iron. Yu. T. Lukashevich-Duvanova. <i>Sovetskaya Pechenka- sogo Inst. Metal.</i> 7, 105-8(1931).--The inclusions con- sisted of Al silicate, Al_2O_3, SiO_2, and traces of Mn and Fe silicates. Al_2O_3 is the most harmful constituent. H. Cohen</p>																																																			
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<div style="display: flex; justify-content: space-between;"> BC B-I-5 </div> <p style="text-align: center;"> Nature of slag inclusions in steel, and their determination. I. T. LUKASHVITSCH-DUVAROVA (Rep. Inst. Mat., Leningrad, 1953, No. 15, 143-164).—The non-metallic inclusions were separated by the Henry-Dickinson method, modified by the addition to the solvent of citric acid to prevent formation of basic Fe salts. Ch. Abs. (c) </p>																																																			
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COMMON ELEMENTS																										PROCESS AND PROPERTIES INDEX																									
MATERIALS INDEX																										METALLURGICAL LITERATURE CLASSIFICATION																									
<p>(18)</p> <p>Study of slag inclusions in steel. Yu. T. Lukashevich-Duvanov. <i>Zashchita Lab.</i> 3, 12 20(1933); cf. Duimov, 1943, 1, No. 10(1932).—Slag inclusions were sepd. from steels with a mixt. of 10% HNO₃ and citric acid (Dickenson, C. A. 20, 2043) and by electrolysis with the addn. of a little citric acid (Pitterer, C. A. 25, 6698; 26, 2140), and then classified according to the 20 photomicrographs.</p>																										<p>7</p>																									
																										<p>19</p>																									

1

Study of slag inclusions in steel. Yu. T. Lukashovich...
Duyanova. Zavodskaya Lab. 3, 130-4(1934); cf. C. A.
26, 8661.--The usual procedure was followed in the qual.
and quant. microanalysis of slag inclusions in steel.
Chas. Blanc

ASME SEA METALLURGICAL LITERATURE CLASSIFICATION

CA

9

Nature of slag inclusions in steel and methods of their determination. Yu. T. Lukashevich-Duvanova. *Repts. Central Inst. Metals, Leningrad No. 16, 19 59 (in English 50) (1934); cf. C. A. 29, 901.* - Various methods used in detg. slag inclusions in steel were compared. Soln. of the samples in H₂O or 1 water gave a sepn. of the same inclusions as soln. in HNO₃, but it takes 3-4 days by the 1st method and 12 days by the 2nd. In either case the Fe carbides are not attacked. The electrolytic method from salt solns. does not dissolve the carbides but seps. addnl. inclusions not found by the other methods. These addnl. inclusions consist of silicate globules enveloped in Fe₂O₃, and of magnetic globules consisting of 70% Fe oxides and 20% MnO. An investigation of inclusions sepd. by the electrolytic method showed the absence of inclusions of MnO and FeO in the metal. Inclusions most detrimental to the quality of the steel were found to be those consisting of Al₂O₃, spinels, Fe oxides and SiO₂, in the form of small sticks. Inclusions more favorable to the quality of the steel are transparent globules, more than 0.01 mm., and consisting mostly of silicates (up to 70% SiO₂). S. I. Madorsky

ASB-SLA METALLURGICAL LITERATURE CLASSIFICATION

PRECISES AND PROPERTIES INDEX																									
1ST AND 2ND ORDERS													3RD AND 4TH ORDERS												
<p>CA</p> <p>Slag inclusions in ferrous alloys. Yu. T. Lukashovich, Duvanova and M. D. Shul'vas. <i>Ref. Central Inst. Metals Leningrad</i> No. 18, 216-25 (1935); cf. C. A. 30: 7809. — Methods of sepg. slag inclusions from ferrochrome (I) and ferromanganese (II) are given. Inclusions in I amount to 0.10-1.80% and consist of silicate, oxides of Cr and Al and chrome spinel. In II, the inclusions amount to 0.2% and consist of alumina, silicate and crystals of Fe.</p> <p>H. Z. Kamich</p>																									
<p>22</p>																									

PROCESSES AND PROPERTIES INDEX

Slag inclusions in acid steel. Yu. F. Lukashevich-Duvanova and P. S. Gernant. *Kachestvennaya Stal* 4, No. 3, 45-54 (1936) (in Russian); *Met. Abstracts (in Metals & Alloys)* 7, 375; cf. C. A. 30, 8128; 31, 3417. Four 15-ton acid open-hearth heats were comprehensively investigated in regard to their nonmetallic inclusions. The latter were sepal. from the metal by dissolving in a mixt. of 10% HNO₃ and 10% citric acid solns. and electrolytically in a soln. contg. 3% FeSO₄, 1% NaCl and 0.2% NH₄ citrate. They were studied under a microscope and analyzed by means of differentiated soln. (cf. C. A. 29, 1917). Amt. and type of inclusions produced during melting and present in the finished metal are about the same. The size of inclusions depends on the cooling rate. Slag is highly dispersed in the metal in molten state. The degree of dispersion or soly. of slag in molten metal is defined by slag concn. in the bath. On addn. of deoxidizers the character of slag inclusions changes slowly and gradually within 30-40 min. Original slag is present in transparent globules of silicates changing on addn. of deoxidizers to dark granular silicates. Al₂O₃ inclusions are present in the bath from the beginning as well as magnetic Fe oxide, observed in solidified samples. Distribution of slag along the depth of the bath is haphazard. M. W. R.

MATERIALS INDEX		PROCESSES AND PROPERTIES INDEX	
<p>CO</p>		<p>9</p>	
<p>Examination of nonmetallic inclusions in steels with the aid of a polarization microscope. Yu. I. Yakushevich, Duvanova and B. V. Ivanov. <i>Zavodskaya Lab.</i> 8, 37-41 (1966); <i>Met. A.</i> 29, 3270, 722P. The nonmetallic inclusions were sepd. from metal in specimens of acid and basic C and non-C open-hearth steels and puddled Fe by electrolysis in FeSO_4, NaCl and tartaric acid electrolytes, and from Fe-Mn by dissolving in 10% HCl. The carbides in the sediments were oxidized with KMnO_4 in acids and then examd. by microanalysis and with the aid of a polarization microscope. Examination of nonmetallic inclusions (in steels) with a polarization microscope on the Federov table. F. A. Yakushevich. <i>Ibid.</i> 41-4. Preliminary results obtained in the microscopic examn. by the Federov method of the mineral inclusions, sepd. from specimens of rolled Cr-Ni open-hearth steels are discussed. Chas. Blanc</p>			
<p>ASME-SCA METALLURGICAL LITERATURE CLASSIFICATION</p>			
<p>SEARCHED INDEXED</p>		<p>ABSTRACTED</p>	
<p>1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100</p>		<p>1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100</p>	

LUKASHEVICH-DUVANOVA, YU. T.

2779 On the Determination of Nonmetallic Inclusions in Steel. Yu. T. Lukashovich-Duvanova. *Henry Brucher, Akad. Metallurg.* v. 11, no. 5, 1936, p. 10-33. (Condensed from Critical review of the various methods of determining the nature of nonmetallic inclusions in steel (electrolytic, chlorine, nitric acid residue methods). Tables, micrographs. 11 ref.

ЗУВРАКОВА, Г.И.

ca

Method for determining slag inclusions in cast iron.
Yu. T. Duvanova and A. N. Valdiman. *Ural. Met.*
1937. No. 1; 45-7; *Chem. Zentr.* 1938, 1, 1202. In-
clusions were sepal. by the electrolytic method of Fitterer,
C. A. 25, 5648; 26, 2140, with an electrolyte contg. 1%
NaCl, 3% $\text{FeSO}_4 \cdot 7\text{H}_2\text{O}$ and 0.3% K tartrate or 0.1%
citric acid. Removal of the graphite is necessary for the
detn. of the more stable slag inclusions. If the specimen
is heated in a current of O_2 at 800-900°, the Si is oxidized
to SiO_2 , which can be only partially removed from the
residue. Therefore, the deposit obtained by electrolysis
was treated with hot 15% KOH soln. twice and the
decompn. of the carbide effected by treating with KMnO_4
in HNO_3 soln. Finally the ppt. was warmed with 5%
KCl soln., washed in the centrifuge, and heated to red-
ness. The principal inclusion was MnS. M. G. M.

ASME STEEL METALLURGICAL LITERATURE CLASSIFICATION

COMMON ELEMENTS		COMMON VARIANTS INDEX	
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100		1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100	
<p>5</p> <p>21</p> <p>PROCESSES AND PROPERTIES INDEX</p> <p>SULPHIDES IN CARBON STEEL. Iu. T. Lukashevich-Duvanova. (Zavodskaya Laboratoriya, 1948, vol 14, Sept., pp 1038-1043). (in Russian). The separation of sulphides from sulphide-carbide residues is discussed and a method is described which enables the pure sulphides to be obtained in quantities sufficient for microanalysis. Sulphides were obtained in this way from basic and acid open-hearth steels, and from Bessemer and crucible steels, and their chemical compositions and microstructures were investigated. It was found that, in carbon steel, sulphides exist mainly in the form of mutually soluble inclusions of iron and manganese sulphides. Manganese sulphide is less frequently found, while pure iron sulphide is never found in steel containing manganese. The sulphides of iron and manganese were found to be capable of retaining ferrous oxide and silica in their solutions.—S.K.</p>			
<p>ASB-SLA METALLURGICAL LITERATURE CLASSIFICATION</p> <p>1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100</p>			

1ST AND 2ND CODES										3RD AND 4TH CODES									
PROCESSING AND PROPERTIES INDEX																			
<p>5</p> <p>ON THE METHODS OF DETERMINING CARBIDES AND SLAG INCLUSIONS IN STEELS. Ju. T. Lukashevich-Duvanova. (Zavodskaya Laboratoriya, 1949, vol. 18, Mar., pp. 269-274) (In Russian) A review is presented of various methods which have been described in the literature for the separation and analysis of carbides and slag inclusions in steel. The methods are discussed in the light of experimental results, attention being given to the mutual influence of carbide and sulphide inclusions on their analyses. Some experimental results relating to alloy steels are presented. Vanadium steel was found to contain only the carbide corresponding to the formula V_4C_3; molybdenum steel was found to contain the carbides of both molybdenum and iron; the carbides of both iron and titanium were found in titanium steel, the composition of the former corresponding to TiC; the chromium carbide found together with cementite in chromium steel corresponded in composition to CrC_4. The nature of the carbide phases is discussed.</p> <p>S.K.</p>																			
<p>21</p>																			
<p>ASB-11A METALLURGICAL LITERATURE CLASSIFICATION</p>																			
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C. A.
1951

Metallurgy and metallography

Sulfides in alloy steel. Yu. T. Lukashevich-Duvanova
(A. A. Balkov Inst. Met., Acad. Sci. U.S.S.R.). *Invent.
Akad. Nauk S.S.S.R., (Mekh. Tekh. Nauk 1950, 126-31).*
Eight 25-kg. steel heats each contg. approx. C 0.40 and S
0.16% were prepl. in a high-frequency furnace; one steel
contained no alloying elements, the others contained one of
the following: V 3.29; Mo 2.40; Al 1.32; Ti 0.97; Ni
3.30; or W 3.0%. After electrolytic dissoln., the carbide
residue was analyzed for total and HCl-sol. S, and the sulfide
inclusions were microscopically examd. The S in plain C
steel was present as (FeMn)S in the ferrite and was readily
sol. in HCl. In Mo, Cr, and W steels the S formed complex
sulfides in which $\frac{1}{4}$ of the S was sol. In V and Al steels the
S formed sulfide inclusions with the carbides; this S was
sol. In Ti steel the sulfides were inside the carbide in-
clusions and were insol. H. W. Rathmann

LUKASHEVICH-DUVANOVA, Yu., T.,

Pa. 173T82

USSR/Metals - Metallography

Oct 50

"Role of A. A. Baykov in the Investigation of
Nonmetallic Inclusions in Steel," Yu. T. Luka-
shevich-Duvanov, Metallurgical Inst imeni A. A.
Baykov

"Iz Ak Nauk SSSR, Otdel Tekh Nauk" No 10,
pp 1522-1528

Divides inclusions into 5 groups--oxides, sili-
cates, aluminates, sulfides and nitrides. De-
scribes them, and discusses occurrence and effect.
Submitted by Acad I. P. Bardin.

173T82

5

SULPHIDES IN ALLOY STEELS. J. Burdin and Ju. Lukashovich-Dubanowa. (Izvestiya Akademii Nauk, U.S.S.R.: Hutnik, 1950, vol. 17, July-Aug., pp. 216-263). Translated from Russian into Polish). On the basis of analytical and microscopical examinations it is postulated that in alloy steels sulphides exist in a combined form comprising sulphides of alloying elements which are not always present as inclusions in metal. The carbides of titanium, vanadium, and aluminum are probably to a certain extent of chromium, molybdenum, and tungsten are able to retain a considerable amount of sulphides in solution at high temperatures. These sulphides form stable compounds with carbides and on cooling remain in solution or are only partly precipitated. When sulphides on cooling remain completely or partly in carbides it is possible to assume that sulphur has no deleterious effect on the metal. The presence of slightly soluble (in HCL) sulphides should be less harmful, since they could not become a nucleus of oxidation process usually caused by ferrous and manganese sulphides. The beneficial influence of chromium, molybdenum, tungsten, vanadium, aluminum, and in particular of

ASM-AIA METALLURGICAL LITERATURE CLASSIFICATION

12000 170000000 123000 170000000 123000 170000000 123000 170000000

titanium, on steel is explained not so much by their deoxidizing power and in some cases nitrogen fixing properties as by the transfer of sulphides into combined sulphide carbides which are less harmful than simple sulphides.---V.G.

LUKASHEVICH-DUVANOVA, Iu. T.

PHASE I Treasure Island Bibliographic Report

BOOK

Call No.: TW707.184

00000064

Author: LUKASHEVICH-DUVANOVA, Iu. T.

Full Title: CINDER INCLUSIONS IN IRON AND STEEL

Transliterated Title: Shlakovye vklucheniia v zheleze i stali.

Publishing Data

Originating Agency: None.

Publishing House: State Scientific-Technical Publishing House on Ferrous and Nonferrous Metallurgy. (Metallurgizdat).

Date: 1952.

No. pp.: 187.

No. copies: 4,000

Editorial Staff

Editor: None

Technical Editor: None.

Editor-in-Chief: None.

Appraiser: None.

Text Data

Coverage: The book contains a critical appraisal of methods used for determining cinder inclusions in iron and steel and complex methods are given for their analysis. Various kinds of cinder inclusions separated from different samples of iron and steel are discussed, namely, from samples of acid and base Marten and electric steel, from Bessemer, Thomas and crucible steel, from puddled iron and from some ferrous alloys. A classification of cinder inclusions is given; the relationship between the character of inclusions and the methods of steel production is analysed, as well as the method of smelting and dioxidation. The book is supplied with 43 tables and supplemented with an atlas of 227 photographs, showing various types of cinder inclusions arranged

LUKASHEVICH -DUVANOV, Iu. T.

00000064

Card 2/2

Call.: TN707.L84

Full Title: CINDER INCLUSIONS IN IRON AND STEEL

Text Data

Coverage: (continued)

according to the given classification.

Purpose: The book is intended for scientific engineering and technical workers in research institutes, in factory laboratories and steel-smelting shops of the metallurgical and machine-construction industries. The book can also be used by students at engineering institutes.

Facilities: None.

No. of Russian References: 57.

Available: Library of Congress

LUKASHEVICH-DUVANOVA, Yu. T.

BAYKOV, Aleksandr Aleksandrovich, akademik; BARDIN, I.P., akademik, otvetstvennyy redaktor; DLUGACH, L.S., professor, vedushchiy redaktor; BAYKOVA, A.D., redaktor; LEHEDEV, V.P., redaktor; SOKOLOV, N.A., redaktor; SHUSHPANOV, L.I., kandidat tekhnicheskikh nauk, redaktor; PAVLOV, M.A., akademik, redaktor; GUDTSOV, N.T., akademik, redaktor; BRITSKE, N.V., akademik, redaktor; CHIZHEVSKIY, N.P., akademik, redaktor [deceased]; URAZOV, G.G., akademik, redaktor; VOL'FKOVICH, S.I., akademik, redaktor; KARNAUKHOV, M.M., chlen-korrespondent, redaktor; STARK, B.V., chlen-korrespondent, redaktor; KASHCHENKO, G.A., professor, redaktor; MONASTYRSKIY, D.N., professor, redaktor; PEVZNER, R.L., professor, redaktor; TUMAREV, A.S., professor, redaktor; SHCHAPOV, N.P., professor, redaktor; KIND, V.V. kandidat tekhnicheskikh nauk, redaktor; LUKASHEVICH-DUVANOVA, Yu.T., kandidat tekhnicheskikh nauk, redaktor; SMIRNOVA, A.V., tekhnicheskii redaktor

[Collected works] Sobranie trudov. Moskva, Izd-vo Akademii nauk SSSR.
Vol. 1. [Articles, addresses and speeches] Stat'i, vystupleniia i
rech'i. 1952. 344 p. (MLRA 8:2)
(Baikov, Aleksandr Aleksandrovich, 1870-1946)

LUKASHEVICH (DUVANOVA), Yuliya Trofimovna.

Academic degree of Doctor of Technical Sciences, based on her defense, 15 April 1954, in the Council of the Inst of Metallurgy imeni Baykov Acad Sci USSR, of dissertation entitled: "Slag impurities in iron and steel".

Academic degree and/or title: Doctor of Sciences

SO: Decisions of VAK, List no 8 2 April 55, Byulleten' MVO SSSR, No. 14, July Moscow pp 4-22, Uncl.
JPRS/NY-429

LUKASHEVICH, DUVANOVA, YU. T.

Lukashovich-Duvanova, Yu. T.: Schlackeninschlüsse in
Eisen und Stahl; Translated from Russian. Berlin:
Verlag Technik, 1955. 200 pp. DM 24.00. Cf. C.A.
48.112618.

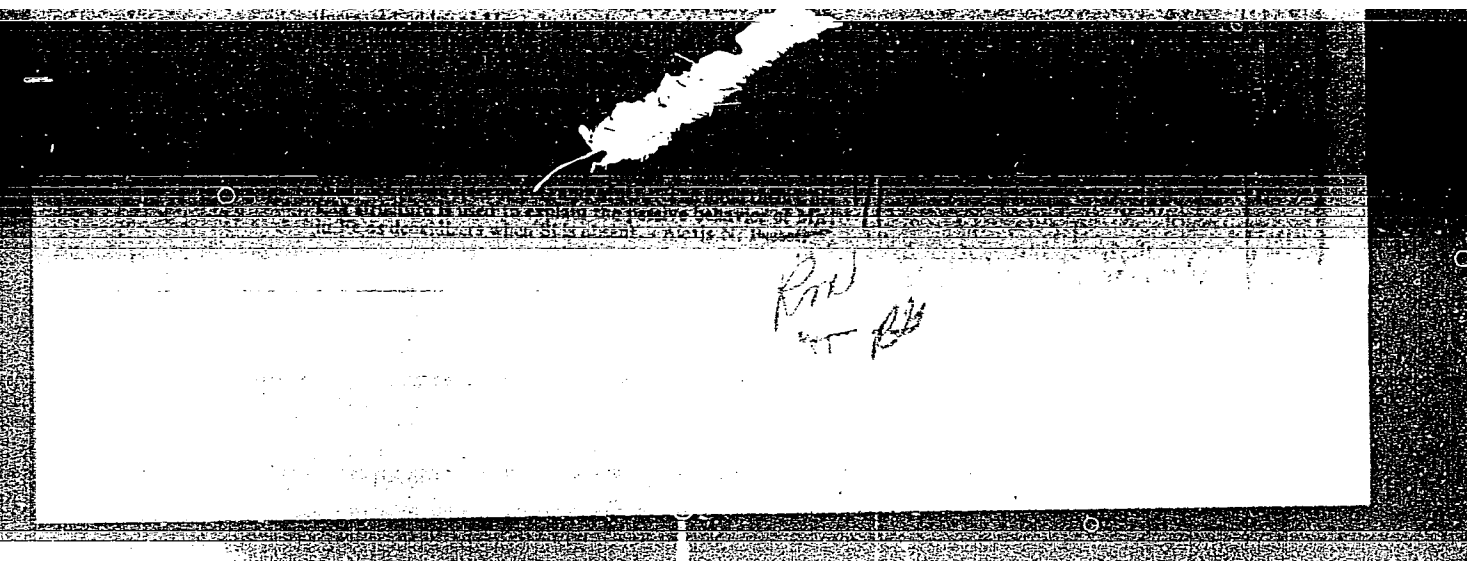
Translation of Title: Slag Contents in Iron and Steel.
Translated from Russian

met

Lukashchik, DUVANOVA, Yu. I.

"APPROVED FOR RELEASE: 04/03/2001

CIA-RDP86-00513R001030730005-2



APPROVED FOR RELEASE: 04/03/2001

CIA-RDP86-00513R001030730005-2"

-LUKASHEVICH-DUVANOVA, Yu.T.,, KRUGLOVA, E.V.

"Sulfides in Steel Deoxidized by Aluminum,"
lecture given at the Fourth Conference on Steelmaking, A.A. Baikov Institute of
Metallurgy, Moscow, July 1-6, 1957

LUKASHEVICH-DUVANOVA, Yul'ya., DIMANT, O.B., SAMARIN, A.M.

"Structure of Non-Metallic Inclusions and Oxide Films in Ferrochrome Alloys,"
lecture given at the Fourth Conference on Steelmaking, A.A. Baikov Institute of
Metallurgy, Moscow, July 1-6, 1957

LUKASHEVICH-DUVANOVA, Yu. T.

137-1958-1-395

Translation from: Referativnyy zhurnal. Metallurgiya. 1958 Nr 1. p 63 (USSR)

AUTHORS: Lukashevich-Duvanova, Yu. T.; Karsanova V. I.

TITLE: The Behavior of Sulfur in the Alloying and Reduction of Steel
(Povedeniye sery pri legirovanii i raskislenii stali)

PERIODICAL: V sb.: Fiz.-khim. osnovy proiz-va stali. Moscow. AN SSSR, 1957. pp 590-601. Diskus. pp 650-655

ABSTRACT: Heats of carbon steel made in a 20-kg acid induction furnace were employed to investigate the effect on $[O]$ and $[S]$ of reduction (R) by 150 g Si-Mn-Ca and Si-Mn-Ca-Mg introduced with the flow in pouring, as compared to that of R by Fe-Si with Fe-Mn or Si-Mn, totaling 150 g introduced into the crucible before pouring, with subsequent R by Al (5 g/t). The nonmetallic inclusions (NI) were studied by microscopic and microchemical methods. It was found that steel deoxidized by Fe-Mn, Fe-Si, and Al contained MnS and Al_2S_3 uniformly distributed in the grains of metal. With R by Si-Mn and Al grains of MnS, Al_2S_3 , and FeS appeared, more rounded in shape and distributed along the grain boundaries. The hypothesis is advanced that Al_2S_3 and MnS are precipitated on the crystals of Al_2O_3 previously formed. On R by Si-Mn-Ca,

Card 1/2

137-1958-1-395

The Behavior of Sulfur in the Alloying and Reduction of Steel

black shells of sulfides of MnS, CaS, and FeS appeared over the silicate NI's distributed in the grains of metal. It is observed that the presence of large amounts of crystalline MnS in these NI's lowers their temperature of fusion and impairs their elimination from the metal. On R by Si-Mn-Ca-Mg, large balls of silicate inclusions in black envelopes of Mn, Fe, Ca, and Mg sulfides were observed. It is noted that the presence of Mg in their composition made for a reduction in fusion temperature, coalescence, and elimination from the metal. In this connection, the content of silicates and S diminished to 0.03 and 0.056%, respectively, as compared with 0.05 and 0.07% by other methods of R.

A.Sh.

- 1. ~~Steel-Deoxidation~~-Effects of sulfur
- 2. ~~Steel-Manufacture~~
- 3. ~~Sulfur-Chemical reactions~~

Card 2/2

LUKASHEVICH-DUBANOVA, Yu. T.

НЕМЕТАЛЛИЧЕСКИЕ ВКЛЮЧЕНИЯ СТАЛИ

С.И.Повал	Очистка внешней стали от тугоплав-
Г.Ф.Ковалев	ких включений
С.Е.Валеев	Влияние метода раскисления стали на
А.М.Самарин	крупность неметаллических включений
Д.К.Бутачев	Влияние водорода на обособление со-
Л.М.Мельников	един в структуре литейной стали
С.Т.Ростовцев	Особенности неметаллических включений
Д.И.Турецкий	в конвертерной ралейской стали
В.И.Богдановский	
М.С.Прохоров	
В.А.Турецкий	Влияние на количество неметаллических
Ю.Т.Лукашевич	включений в стали, содержащей титан
Д.М.Турецкий	
Ю.Т.Лукашевич	Влияние на количество неметаллических
Д.М.Турецкий	включений в стали, содержащей титан
О.В.Шиман	
Е.В.Круглов	
А.И.Хомин	Особенности раскисления в промен-
	ной печи
С.Г.Васильев	Разработка и внедрение новых техно-
П.М.Давыдов	логических процессов производства
	стали
В.П.Карасев	Влияние пути раскисления на
П.Я.Анохин	свойства металла

report submitted for the 5th Physical Chemical
Conference on Steel Production, Moscow-- 30 Jun 1959.

LUKASHEVICH-DUBANOVA, YU. T.
CHRONOLOGICAL INDEX.

18(0) PHASE 1 BOOK EXPLOSION 507/2515

Академия наук СССР. Институт атомной и технической информации:
Металлургия СССР, 1917-1977 [и др.] (Metallurgy in the USSR, 1917-1977; Vol
2) Moscow, Metallurgizdat, 1979. 811 p. Karta slip inserted. 5,000
copies printed.

24. (Title page): I. P. Bardin, Academician; Ed. (Inside book): G. V. Popov;
Tech. Ed.: P. G. Izmail'yeva.

FOREWORD: This book is intended for metallurgists.

CONTENTS: The articles in this collection present historical data on the
achievements of Soviet metallurgy, both ferrous and nonferrous, during
the period 1917-1977. Advances in theory and technical application are
thoroughly discussed. Many of the articles give an idea of what may be
expected in the future. Advances in metallurgy and other countries are also
discussed. The articles are accompanied by a large number of references.
For further coverage, see Table of Contents.

Card 1/15

216
Klein, J. F., Professor, Doctor of Technical Sciences. (Moscow Institute of
Steel) Use of High Frequency Currents in Physical Metallurgy

The author discusses the following: types of phase transformations
occurring during rapid heating; the magnetic theory of the kinetics
of induction heating; interconnection between original structure, steel
composition, and the kinetics of heating; structure of austenite formed
during induction heating; transformation of austenite into martensite
and tempering after high-frequency hardening; very short cycle
technology of induction heat treatment; recent developments in
and application of induction heating in carburizing.

219
Golovnev, A. P., Professor, Doctor of Technical Sciences. (Moscow Evening
Institute of Machine Design) Heat Treatment and Thermochemical Treatment
of Steel

After giving a classification of the types of heat-treating processes, the
author discusses the thermodynamics, mechanism, and kinetics of phase
changes, as well as the formation, decomposition, and transformation of
martensite. The concluding section deals with diffusion processes.

272
Golossan, Kh. M., Engineer. (Sval'proyekt) Heating and Heat-treating
Furnaces in USSR Ferrous Metallurgy

This is a brief historical review of successive developments in the
theory and design of various types of heating and heat-treating furnaces
from czarist times up to 1971.

304
Ivanov, O. P., Candidate of Technical Sciences. (Sverdlovsk) Theory of
Fuel-fired Furnaces

The article presents a review of developments in the theory and design
of fuel-fired furnaces (mainly open-hearth) from 1935 to 1977, empha-
sizing the need for refining the theory on the basis of model testing.

— Lukashovich-Dubanova, Yu. T., Doctor of Technical Sciences. (Institute of
Metallurgy and P. M. Mayrov, USSR Academy of Sciences) Investigation of
Nonmetallic Inclusions

Card 7/15

SOV/180-59-3-18/43

AUTHORS: Lukashevich-Duvanova, Yu.T. and Urazova, V.A., (Moscow)
 TITLE: The Determination of Titanium Oxide Inclusions
 PERIODICAL: Izvestiya Akademii nauk SSSR, Otdeleniye tekhnicheskikh nauk, Metallurgiya i toplivo, 1959, Nr 3, pp 108-112(USSR)
 ABSTRACT: Low carbon steels were prepared containing various contents of titanium (table 1). Microscopic, X-ray and petrographic analysis were carried out to investigate the oxide inclusions. It was shown that small amounts of titanium form ilmenite in steels (Fig 1-3) and 0.2 to 0.8% Ti form Ti_2O_3 (Fig 4 and 5). A method of phase analysis was worked out. Results are shown in Table 2. It can be seen from these that ilmenite is present at 0.04% Ti and the amount increases with Ti content up to 0.2%. Ti_2O_3 is present with 0.1% Ti and the amount increases with increasing Ti content. TiO_2 was not detected. When the metal is preliminarily oxidised by silicon and an addition of titanium is made, globular inclusions are seen. These are silicates and analysis shows that Ti_2O_3 is present in the silicates (Table 3). As the Ti content is increased the amount of Ti_2O_3 in the silicates increases. No free titanium

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The Determination of Titanium Oxide Inclusions

oxides were found even with 0.9% titanium present.
There are 7 figures, 3 tables and 6 references,
2 of which are English, 1 German and 3 Soviet.

SUBMITTED: January 22, 1959

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67804

SOV/180-59-5-21/37

AUTHORS: Lukashevich-Duvanov, Yu.T., and Urazova, V.A. (Moscow)

TITLE: Investigation of the Nature of the Carbide Phase in Steels with Additions of Titanium

PERIODICAL: Izvestiya Akademii nauk SSSR, Otdeleniye tekhnicheskikh nauk, Metallurgiya i toplivo, 1959, Nr 5, pp 127-130 (USSR)

ABSTRACT: Although the types of titanium compounds in steel have been considered by several authors (Refs 1-3) and Lukashevich-Duvanov (Ref 4) has indicated that carbosulphides may be formed, the conditions for the formation of pure titanium carbide and for the formation of solutions with other titanium compounds are still unknown. In the present investigation steels with 0.07-0.25% C, 0.15-1.80% Ti, 0.01-0.04% S and 0.070-0.093 (when determined) % O₂ (Table 1) were used. 300-g ingots were vacuum melted from reduced or armco iron, carbon and titanium being added as graphite (spectroscopically pure) and Fe-Ti alloy, respectively. Ingots were metallographically examined and dissolved electrolytically. In steels with 0.15-0.90% Ti and 0.08% C the irregular grey, crystalline inclusions (Fig 1) were found to be TiC crystallizing with a great deficiency of carbon

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(lattice parameter 4.31 \AA). Steels with about 0.2% C and low in titanium contain fine dendritic inclusions (Fig 2a) whose quantity and size increase at higher titanium contents. All heats contained oxide inclusions of titanium (and/or aluminium). The composition of the dendrites is given in Table 2; the dendritic inclusions isolated were titanium carbide corresponding to TiC and containing a little sulphur. The presence of sulphur was confirmed by a special heat with 0.11% S, whose inclusions (Fig 4) contained 21.7% S. It is not known whether the various dendritic inclusions are two-phase or represent a limited-solubility solid solution. Table 3 shows results of a phase analysis, based on the different solubilities of the carbides of titanium and of iron, made to find the relative amounts of these substances. The authors conclude that with increasing titanium content of the metal the quantity of iron-carbide phase falls and that of titanium carbide rises. Iron carbide dissolves a little titanium carbide. The amount of oxide inclusions of titanium present as

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$Al_2O_3.TiO_2$ remains almost unchanged. They draw attention to the fact that with a large excess of titanium (with respect to carbon) the precipitate contains about 10% iron carbide, while with a titanium content four times that of carbon it consists of 53% iron carbide and only 38% titanium carbide. There are 4 figures, 3 tables and 5 references, of which 3 are Soviet, 1 is English and 1 is German.

SUBMITTED: April 15, 1959

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69652

S/180/60/000/02/006/028

E071/E135

18.1110

AUTHORS: Lukashevich-Duvanova, Yu.T., and Urazova, V.A. (Moscow)

TITLE: Sulphide Inclusions in Steels Containing Titanium,
Additions

PERIODICAL: Izvestiya Akademii nauk SSSR, Otdeleniye tekhnicheskikh nauk, Metallurgiya i toplivo, 1960, Nr 2, pp 42-48 (USSR)

ABSTRACT: Despite a comparatively large number of papers dealing with studies of titanium sulphides, it is not known whether these are pure titanium sulphides or mixed with sulphides of other elements and whether they form only sulphide inclusions or isomorphic mixtures with carbides and oxides. For this reason an investigation of titanium sulphides was carried out using specimens from special heats made either from powdered iron, containing about 0.1% of oxygen and traces of manganese, silicon, carbon and sulphur, or from armco iron. Smelting was done in an open furnace and in vacuo. Sulphur was introduced in the form of iron sulphide, its content in all melts being practically the same, about 0.1%. Titanium was introduced in the form of a ferrotitanium alloy (25% Ti), its content in specimens varying from

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Sulphide Inclusions in Steels Containing Titanium Additions

0.05 to 0.7%. Some specimens were preliminarily deoxidized with aluminium. In addition specimens from industrially smelted automatic and stainless steels were studied. The chemical composition of the specimens investigated is given in Table 1. Microscopic chemical and X-ray methods were used in the studies. Chemical analyses of sulphide inclusions are given in Tables 2, 3, 4, and 5. The appearance of inclusions is shown in Fig 1. It was found that the nature and composition of titanium sulphide inclusions depend on the content of oxygen and carbon in the metal. It was established that individual titanium sulphide inclusions in low carbon steel are not present. Usually two-phase inclusions of titanium carbosulphides ($TiC + Ti_2S_3$) or oxysulphides ($Ti_2O_3 + Ti_2S_3$) are formed. With increasing titanium content in the metal the proportion of titanium carbo- and oxy- sulphides increases and that of ferrous sulphide decreases. The results of the investigation indicated that in order to induce the formation of

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E071/E135

Sulphide Inclusions in Steels Containing Titanium Additions
carbosulphide inclusions in steel, titanium should be
introduced into the preliminarily deoxidized metal.

There are 1 figure, 5 tables and 7 references, of
which 3 are Soviet, 2 English and 2 German.

SUBMITTED: September 22, 1959

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SAMARIN, A.M.;¹ LUKASHEVICH-DUVANOVA, Yu.T.; DIMANT, O.V.

Determination of nonmetallic inclusions in niobium and zirconium.
Trudy Kom. anal. khim. 12:94-107 '60. (MIRA 13:8)
(Niobium--Analysis) (Zirconium--Analysis)
(Nonmetallic minerals)

LUKASHEVICH - DUVANOVA, YU. T.

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PHASE I BOOK EXPLOITATION

SOV/5411

Konferentsiya po fiziko-khimicheskim osnovam proizvodstva stali. 5th,
Moscow, 1959.

Fiziko-khimicheskiye osnovy proizvodstva stali; trudy konferentsii
(Physicochemical Bases of Steel Making; Transactions of the
Fifth Conference on the Physicochemical Bases of Steelmaking)
Moscow, Metallurgizdat, 1961. 512 p. Errata slip inserted.
3,700 copies printed.

Sponsoring Agency: Akademiya nauk SSSR. Institut metallurgii imeni
A. A. Baykova.

Responsible Ed.: A. M. Samarin, Corresponding Member, Academy
of Sciences USSR; Ed. of Publishing House: Ya. D. Rozentsveyg.
Tech. Ed.: V. V. Mikhaylova.

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Physicochemical Bases of (Cont.)

SOV/5411

PURPOSE: This collection of articles is intended for engineers and technicians of metallurgical and machine-building plants, senior students of schools of higher education, staff members of design bureaus and planning institutes, and scientific research workers.

COVERAGE: The collection contains reports presented at the fifth annual convention devoted to the review of the physicochemical bases of the steelmaking process. These reports deal with problems of the mechanism and kinetics of reactions taking place in the molten metal in steelmaking furnaces. The following are also discussed: problems involved in the production of alloyed steel, the structure of the ingot, the mechanism of solidification, and the converter steelmaking process. The articles contain conclusions drawn from the results of experimental studies, and are accompanied by references of which most are Soviet.

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Physicochemical Bases of (Cont.)

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Urazova, V. A., and Yu. T. Lukashevich-Duvanova.
Inclusions in the Titanium-Containing Low-Carbon
Steel

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Lukashevich-Duvanova, Yu. T., and O. V. Dimant.
Inclusions in Zirconium- and Niobium-Containing
Low-Carbon Steel

364

Kholodov, A. I. Precipitation Deoxidation in a Basic
Electric Furnace

384

Kholodov, A. I. Precipitation Deoxidation in an Acid
Electric Furnace

391

Voinov, S. G. Development and Introduction of New
Techniques in Making Ball-Bearing Steel; Mechanism
of the Formation of Nonmetallic Inclusions

398

Ageyev, P. Ya. Kinetics of Metal Deoxidation Processes

422

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S/180/62/000/006/005/022
E111/E451

AUTHORS: Lukashevich-Duvanova, Yu.T., Urazova, V.A. (Moscow)
TITLE: Nitride inclusions in low-carbon high-chromium steel
PERIODICAL: Akademiya nauk SSSR. Izvestiya. Otdeleniye
tekhnicheskikh nauk. Metallurgiya i toplivo, no.6,
1962, 73-80

TEXT: Heats with about 15 to 17% Cr, 0.04 to 0.08% C and 0.1 to 0.2% N and various percentages of manganese (0.48 to 1.05), molybdenum (0.24 to 0.88), vanadium (0.28 to 0.95), niobium (0.12 to 0.75), titanium (0.20 to 1.50), zirconium (0.30 to 1.40) and boron (0.36 to 2.62) were prepared and specimens subjected to various heat treatments. Metallographic and chemical examination (by a method which distinguished between nitrogen dissolved in the metal and nitrogen present as various nitrides) together with X-ray diffraction analysis led to the following conclusions. Additions of aluminium, titanium or zirconium form inclusions of AlN, TiN and complex nitrides of zirconium and iron. Additions of vanadium or niobium to the same steel produce carbonitrides of vanadium or niobium. Addition of boron produces boron carbonitrides which crystallize on iron-boride crystals. Total nitrogen in the steel
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Nitride inclusions ...

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risers with increasing titanium, zirconium and aluminium content, titanium and zirconium having the greatest affinity for nitrogen. Increasing aluminium, vanadium, niobium and boron contents produce an increase in the quantity of nitrogen combined as the corresponding nitrides, but dissolved nitrogen falls and the total nitrogen hardly changes. Heating the high-chromium steel containing niobium and vanadium to 1200°C and water quenching results in almost complete transfer into solid solution of the carbonitride-combined nitrogen. Corresponding treatment of the aluminium-containing steel converts most of the dissolved nitrogen into aluminium nitride. Heating of high-chromium steel containing boron reduces the total nitrogen-content. There are 3 figures and 1 table. ✓

SUBMITTED: June 26, 1962

Card 2/2

ZHIVUCHIN, S.M.; TOLSTOGUZOV, V.B.; LOKACHENSKI, ..

Reaction of trimeric phosphonitryle chloride with alcohols
and alcoholates. Zhur. neorg. khim. 10 no.7:1653-1656 1965.
(MIRA 1968)

LUKASHEVSKIY, A.

Safeguarding the timber wealth. Pozh.delo 9 no.10:21 0 '63.
(MIRA 16:12)

NIKOLAYEV, L., inzh.; OLEYNIK, G.; DRUST, V.; MINISHEV, P., inzh.; LUKASHEVSKIY, L., inzh.

Adopted at the Exhibition of the Achievements of the National Economy and introduced into industrial production. Inform.biul. VDNKH no.11:11-12 N '64. (MIRA 18:2)

1. TSentral'noye byuro tekhnicheskoy informatsii Privolzhskogo soveta narodnogo 'hozyaystva (for Oleynik). 2. Latvyskiy institut nauchno-tekhnicheskoy informatsii (for Drust).